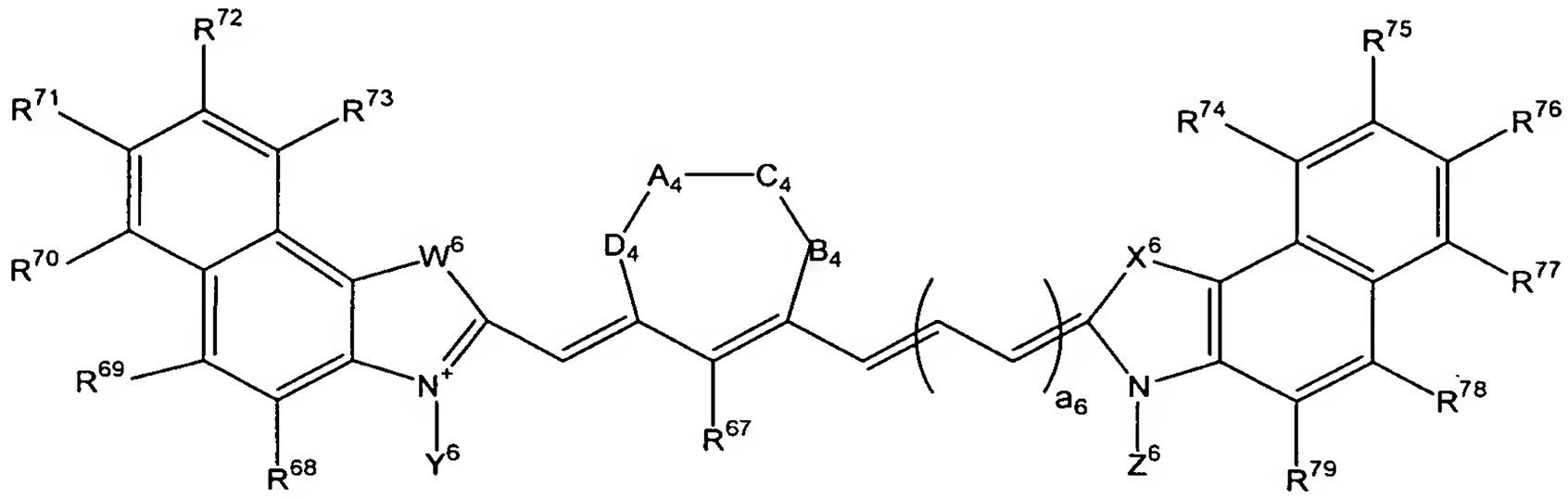
What is claimed is:

1. A method for performing a diagnostic or therapeutic procedure comprising

administering to an individual an effective amount of the compound of formula 4



wherein W^6 and X^6 are independently selected from the group consisting of $-CR^1R^2$, -O-, $-NR^3$, and -S-; Y^6 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, $-H_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-N(R^3)-(CH_2)_b-CONH-Bm$, $(CH_2)_a-N(R^3)-(CH_2)_c-NHCO-Bm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-NHCO-Bm$, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; Z^6 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10}

aminoalkyl, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Dm$, $-(CH_2)_a-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Dm$, $-(CH_2)_a-N(R^3)-(CH_2)_b-CONH-Dm$, $(CH_2)_a-N(R^3)-(CH_2)_c-NHCO-Dm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Dm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-NHCO-Dm$, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; A_4 is a single or a double bond; B_4, C_4, and D_4 are independently selected from the group consisting of -O-, -S-, -Se-, -P-, $-CR^1R^2$, $-CR^1$, alkyl, NR^3, and -C=O; A_4, B_4, C_4, and D_4 may together form a 6- to 12-membered carbocyclic ring or a 6- to 12-membered heterocyclic ring optionally containing one or more oxygen, nitrogen, or sulfur atom; a_6 is from 0 to 5; R^1 to R^4, and R^{67} to R^{79} are independently selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, glucose derivatives of R groups, cyano, nitro, halogen, saccharide, peptide, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-OH$ and $-CH_2-(CH_2OCH_2)_b-CO_2H$; Bm and Dm are independently selected from the group consisting of a bioactive peptide, a protein, a cell, an antibody, an antibody fragment, a saccharide, a glycopeptide, a peptidomimetic, a drug, a drug mimic, a hormone, a metal a chelating agent, a radioactive or nonradioactive metal complex, and an echogenic agent; a and c are independently from 1 to 20; and b and d are

independently from 1 to 100, with the proviso that either Y^6 or Z^6 contains a biomolecule Bm or Dm, and with the proviso that when W^6 and X^6 are $C((CH_2)OH)_2$, Y^6 is not $(CH_2)_2$-CONH-Bm,

activating the compound, and

performing the diagnostic or therapeutic procedure.

2. The method of claim 1 comprising administering to an individual an effective amount of the compound wherein W^6 and X^6 are independently selected from the group consisting of $-C(CH_3)_2$, $-C((CH_2)_aOH)CH_3$, $-C((CH_2)_aOH)_2$, $-C((CH_2)_aCO_2H)CH_3$, $-C((CH_2)_aCO_2H)_2$, $-C((CH_2)_aNH_2)CH_3$, $C((CH_2)_aNH_2)_2$, $C((CH_2)_aNR^3R^4)_2$, $-NR^3$, and -S-; Y^6 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a$-CONH-Bm, $-CH_2-(CH_2OCH_2)_b-CH_2$-CONH-Bm, $-(CH_2)_a$-NHCO-Bm, $-CH_2-(CH_2OCH_2)_b-CH_2$-NHCO-Bm, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; Z^6 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a$-CONH-Dm, $-CH_2-(CH_2OCH_2)_b-CH_2$-CONH-Dm, $-(CH_2)_a$-NHCO-Dm, $-CH_2-(CH_2OCH_2)_b-CH_2$-NHCO-Dm, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; A_4 is a single or a double bond; B_4, C_4, and D_4 are independently selected from the group consisting of -O-, -S-, NR^3, $(CH2)_a$ $-CR^1R^2$, and $-CR^1$; A_4, B_4, C_4, and D_4 may together form a 6- to 10-membered carbocyclic ring or a 6- to 10-membered

heterocyclic ring optionally containing one or more oxygen, nitrogen, or sulfur atom; a_6 is from 0 to 3; R^1 to R^4, and R^{67} to R^{79} are independently selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{12} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyhydroxyalkyl, C_5-C_{12} polyhydroxyaryl, C_1-C_{10} aminoalkyl, mono- or oligosaccharide, peptide with 2 to 30 amino acid units, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-OH$ and $-CH_2-(CH_2OCH_2)_b-CO_2H$; Bm and Dm are independently selected from the group consisting of a bioactive peptide containing 2 to 30 amino acid units, an antibody, a mono- or oligosaccharide, a glycopeptide, a metal chelating agent, a radioactive or nonradioactive metal complex, and an echogenic agent; a and c are independently from 1 to 10; and b and d are independently from 1 to 30, with the proviso that either Y^6 or Z^6 contains a biomolecule Bm or Dm.

3. The method of claim 2 comprising administering to an individual an effective amount of the compound wherein each of W^6 and X^6 is $C((CH_2)OH)_2$; Y^6 is $-(CH_2)_2-CONH-Bm$; Z^6 is $-(CH_2)_2-CO_2H$; A_4 is a single bond; A_4, B_4, C_4, and D_4 together form a 6-membered carbocyclic ring; a_6 is 1; R^{67} is galactose; each R^{68} to R^{79} is hydrogen; and Bm is Octreotate.

4. The method of claim 1 wherein said procedure utilizes light of wavelength in the region of 350-1300 nm.

5. The method of claim 1 wherein the diagnostic procedure is optical tomography.

6. The method of claim 1 wherein said diagnostic procedure is fluorescence endoscopy.

7. The method of claim 1 further comprising monitoring a blood clearance profile of said compound by a method selected from the group consisting of fluorescence, absorbance, and light scattering, wherein light of wavelength in the region of 350-1300 nm is used.

8. The method of claim 1 wherein said procedure further comprises imaging and therapy, wherein said imaging and therapy is selected from the group consisting of absorption, light scattering, photoacoustic and sonofluoresence technique.

9. The method of claim 1 wherein said procedure is capable of diagnosing atherosclerotic plaques and blood clots.

10. The method of claim 1 wherein said procedure comprises administering localized therapy.

11. The method of claim 1 wherein said therapeutic procedure comprises photodynamic therapy.

12. The method of claim 1 wherein said therapeutic procedure comprises laser assisted guided surgery for the detection of micrometastases.

13. The method of claim 1 further comprising adding a biocompatible organic solvent at a concentration of one to fifty percent to the compound to prevent *in vivo* or *in vitro* fluorescence quenching.

14. The method of claim 13 wherein said compound is dissolved in a medium comprising one to fifty percent of at least one of dimethyl sulfoxide, ethyl alcohol, isopropyl alcohol, or glycerol.

15. The method of claim 1 wherein the compound comprises one to ten groups containing Bm, Dm, and combinations thereof providing a cooperative effect to enhance binding of the compound.

16. The method of claim 15 further comprising attaching a compound selected from the group consisting of a porphyrin and a photodynamic therapy agent to biomolecule Bm or Dm, and providing light of a wavelength sufficient to activate the porphyrin or phototherapy agent.

17. The method of claim 15 wherein the procedure monitors blood clearance of the compound to detect an abnormality.

18. The method of claim 15 further comprising activating the compound prior to performing the procedure.

19. The method of claim 1 further comprising administering a non-optical contrast agent and imaging by at least one of magnetic resonance, ultrasound, X-ray, positron emission tomography, computed tomography, and single photon emission computed tomography.

20. The method of claim 1 wherein the compound administered has at least one R group replaced by EDTA, DOTA, or DOTA.

21. The method of claim 20 wherein the compound administered further comprises a radioactive metal ion or a paramagnetic metal ion.

22. The method of claim 21 further comprising imaging by at least one of optical imaging or magnetic resonance imaging.

23. The method of claim 1 wherein the compound is administered in a formulation selected from at least one of liposomes, micelles, microcapsules, or microparticles.

24. A method of imaging a patient comprising administering a non-optical contrast agent composition further comprising the compound of claim 1 and performing at least one of an optical imaging procedure or a non-optical imaging procedure.

25. The method of claim 24 wherein the non-optical contrast agent composition is chosen from a magnetic resonance composition, a computed tomography composition, an x-ray composition, a nuclear imaging composition, a positron emission tomography composition, a single photon emission computed tomography composition, or an ultrasound composition.

26. The method of claim 25 wherein the compound stablilizes or buffers the non-optical contrast agent composition.

27. A method to reduce aggregation of a dye administerable to a patient for a photodiagnostic or phototherapeutic procedure comprising adding to the dye a biocompatible organic solvent at a concentration ranging from about 1% to about 50% to reduce dye aggregation.

28. The method of claim 27 wherein the biocompatible organic solvent is added to a pharmaceutically acceptable formulation of the dye.

29. The method of claim 27 wherein the dye is dissolved or suspended in the biocompatible organic solvent.

30. The method of claim 27 where the biocompatible organic solvent is selected from the group consisting of dimethylsulfoxide, ethyl alcohol, isopropyl alcohol, glycerol, a polyol, or combinations thereof.

31. The method of claim 27 wherein the dye is represented by formulas 1, 2, 3, or 4.

32. A method to enhance fluorescence of a dye administerable to a patient for a photodiagnostic or phototherapeutic procedure comprising adding to the dye a biocompatible organic solvent at a concentration ranging from about 1% to about 50% to enhance dye fluorescence.

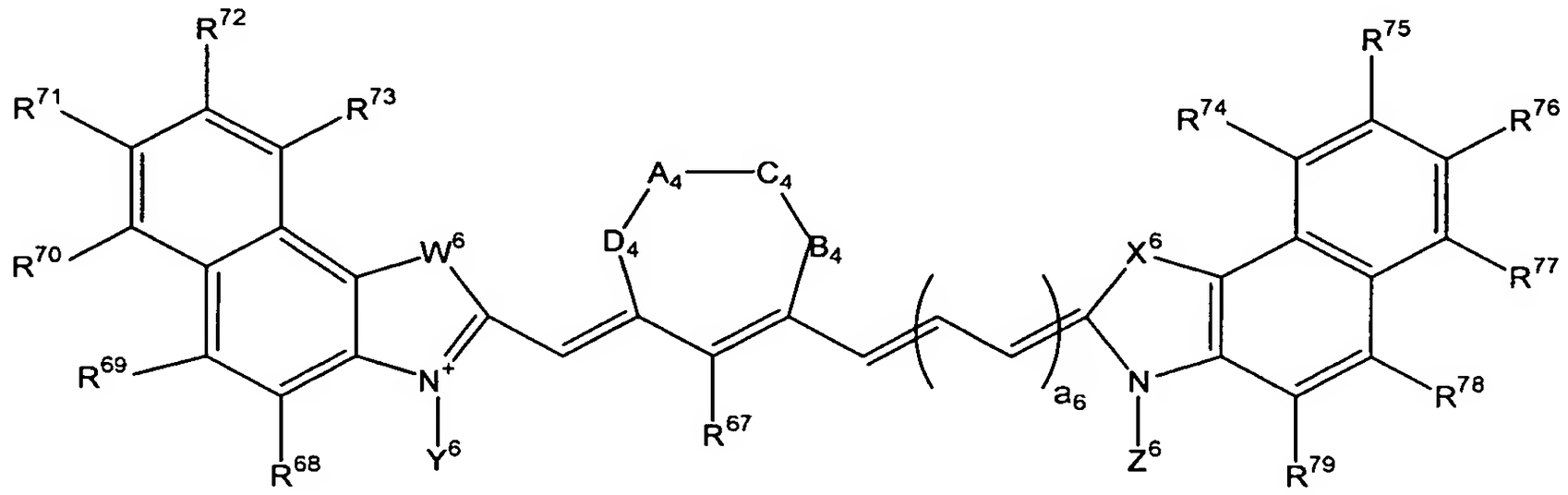
33. The method of claim 32 wherein the biocompatible organic solvent is added to a pharmaceutically acceptable formulation of the dye.

34. The method of claim 32 wherein the dye is dissolved or suspended in the biocompatible organic solvent.

35. The method of claim 32 where the biocompatible organic solvent is selected from the group consisting of dimethylsulfoxide, ethyl alcohol, isopropyl alcohol, glycerol, a polyol, or combinations thereof.

36. The method of claim 32 wherein the dye is represented by formulas 1, 2, 3, or 4.

37. A method to maintain fluorescence of a dye in a photodiagnosis or phototherapy procedure comprising administering to an individual an effective amount of a composition comprising a biocompatible organic solvent at a concentration from about 1% to about 50% and a dye of formula 4



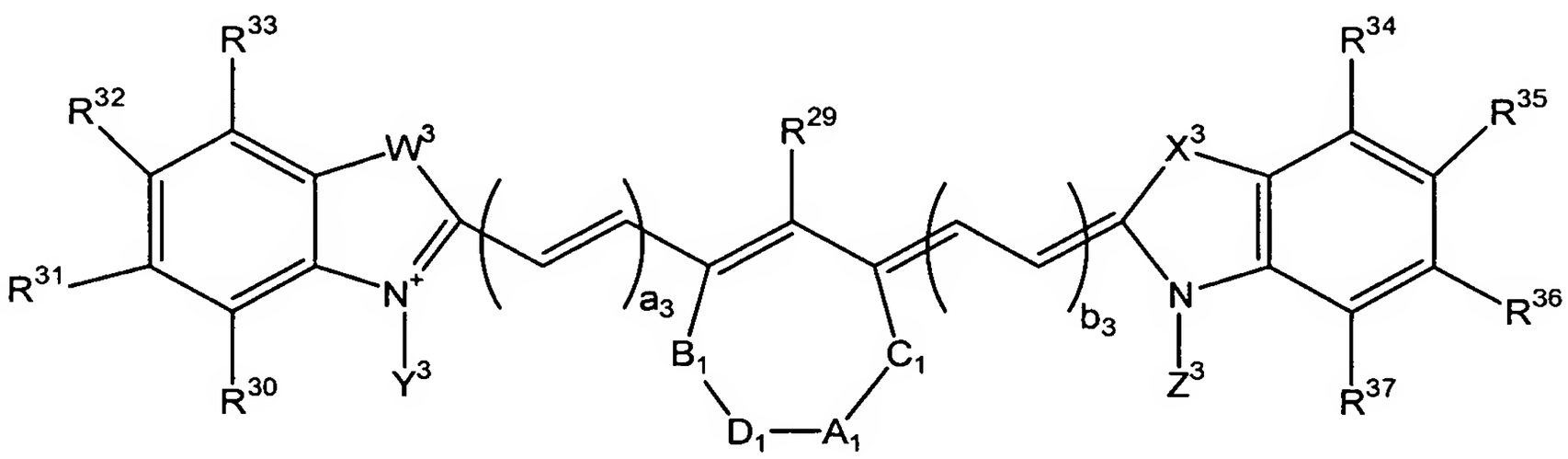
wherein W^6 and X^6 are independently selected from the group consisting of $-CR^1R^2$, -O-, $-NR^3$, and -S-; Y^6 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-N(R^3)-(CH_2)_b-CONH-Bm$, $(CH_2)_a-N(R^3)-(CH_2)_c-NHCO-Bm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-NHCO-Bm$, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; Z^6 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10}

aminoalkyl, -$CH_2(CH_2OCH_2)_b$-CH_2-OH, -$(CH_2)_a$-CO_2H -$(CH_2)_a$-CONH-Dm, -CH_2-$(CH_2OCH_2)_b$-CH_2-CONH-Dm, -$(CH_2)_a$-NHCO-Dm, -CH_2-$(CH_2OCH_2)_b$-CH_2-NHCO-Dm, -$(CH_2)_a$-$N(R^3)$-$(CH_2)_b$-CONH-Dm, $(CH_2)_a$-$N(R^3)$-$(CH_2)_c$-NHCO-Dm, -$(CH_2)_a$-$N(R^3)$-CH_2-$(CH_2OCH_2)_b$-CH_2-CONH-Dm, -$(CH_2)_a$-$N(R^3)$-CH_2-$(CH_2OCH_2)_b$-CH_2-NHCO-Dm, -CH_2-$(CH_2OCH_2)_b$-CH_2-$N(R^3)$-$(CH_2)_a$-CONH-Dm, -CH_2-$(CH_2OCH_2)_b$-CH_2-$N(R^3)$-$(CH_2)_a$-NHCO-Dm, -CH_2-$(CH_2OCH_2)_b$-CH_2-$N(R^3)$-CH_2-$(CH_2OCH_2)_d$-CONH-Dm, -CH_2-$(CH_2OCH_2)_b$-CH_2-$N(R^3)$-CH_2-$(CH_2OCH_2)_d$-NHCO-Dm, -$(CH_2)_a$-NR^3R^4, and -$CH_2(CH_2OCH_2)_b$-$CH_2NR^3R^4$; A_4 is a single or a double bond; B_4, C_4, and D_4 are independently selected from the group consisting of -O-, -S-, -Se-, -P-, -CR^1R^2, -CR^1, alkyl, NR^3, and -C=O; A_4, B_4, C_4, and D_4 may together form a 6- to 12-membered carbocyclic ring or a 6- to 12-membered heterocyclic ring optionally containing one or more oxygen, nitrogen, or sulfur atom; a_6 is from 0 to 5; R^1 to R^4, and R^{67} to R^{79} are independently selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, glucose derivatives of R groups, cyano, nitro, halogen, saccharide, peptide, -$CH_2(CH_2OCH_2)_b$-CH_2-OH, -$(CH_2)_a$-CO_2H, -$(CH_2)_a$-CONH-Bm, -CH_2-$(CH_2OCH_2)_b$-CH_2-CONH-Bm, -$(CH_2)_a$-NHCO-Bm, -CH_2-$(CH_2OCH_2)_b$-CH_2-NHCO-Bm, -$(CH_2)_a$-OH and -CH_2-$(CH_2OCH_2)_b$-CO_2H; Bm and Dm are independently selected from the group consisting of a bioactive peptide, a protein, a cell, an antibody, an antibody fragment, a saccharide, a glycopeptide, a peptidomimetic, a drug, a drug mimic, a hormone, a metal chelating agent, a radioactive or nonradioactive metal complex, and an echogenic agent; a and c are independently from 1 to 20; and b and d are

independently from 1 to 100.

38. The method of claim 37 wherein the organic solvent is selected from the group consisting of dimethylsulfoxide, ethyl alcohol, isopropyl alcohol, a polyol, a glycerol, and combinations thereof.

39. A method to maintain fluorescence of a dye in a photodiagnosis or phototherapy procedure comprising administering to an individual an effective amount of a composition comprising a biocompatible organic solvent at a concentration from about 1% to about 50% and a dye of formula 1



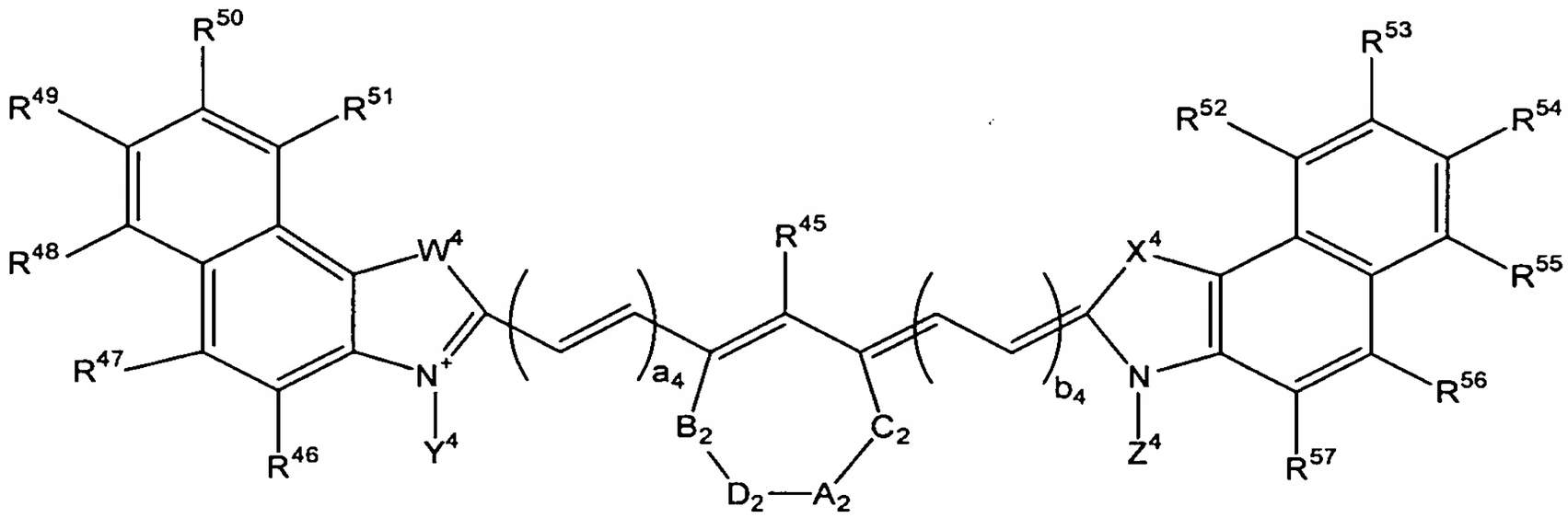
wherein W^3 and X^3 may be the same or different and are selected from the group consisting of $-CR^1R^2$, -O-, $-NR^3$, -S-; Y^3 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-N(R^3)-(CH_2)_b-CONH-Bm$, $-(CH_2)_a-N(R^3)-(CH_2)_c-NHCO-Bm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-NHCO-Bm$, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; Z^3 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Dm$,

$-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Dm$, $-(CH_2)_a-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Dm$, $-(CH_2)_a-N(R^3)-(CH_2)_b-CONH-Dm$, $(CH_2)_a-N(R^3)-(CH_2)_c-NHCO-Dm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Dm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-NHCO-Dm$, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; A_1 is a single or a double bond; B_1, C_1, and D_1 may the same or different and are selected from the group consisting of -O-, -S-, -Se-, -P-, $-CR^1R^2$, $-CR^1$, alkyl, NR^3, and -C=O; A_1, B_1, C_1, and D_1 may together form a 6- to 12-membered carbocyclic ring or a 6- to 12-membered heterocyclic ring optionally containing one or more oxygen, nitrogen, or sulfur atom; a_3 and b_3 independently vary from 0 to 5; R^1 to R^4, and R^{29} to R^{37} are independently selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, glucose derivatives of R groups, cyano, nitro, halogen, saccharide, peptide, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-OH$ and $-CH_2-(CH_2OCH_2)_b-CO_2H$; Bm and Dm are independently selected from the group consisting of a bioactive peptide, a protein, a cell, an antibody, an antibody fragment, a saccharide, a glycopeptide, a peptidomimetic, a drug, a drug mimic, a hormone, a metal chelating agent, a radioactive or nonradioactive metal complex, a photosensitizer for phototherapy, and an echogenic agent; a and c are independently from 1 to 20;

and b and d are independently from 1 to 100.

40. The method of claim 39 wherein the organic solvent is selected from the group consisting of dimethylsulfoxide, ethyl alcohol, isopropyl alcohol, a polyol, a glycerol, and combinations thereof.

41. A method to maintain fluorescence of a dye in a photodiagnosis or phototherapy procedure comprising administering to an individual an effective amount of a composition comprising a biocompatible organic solvent at a concentration from about 1% to about 50% and a dye of formula 2



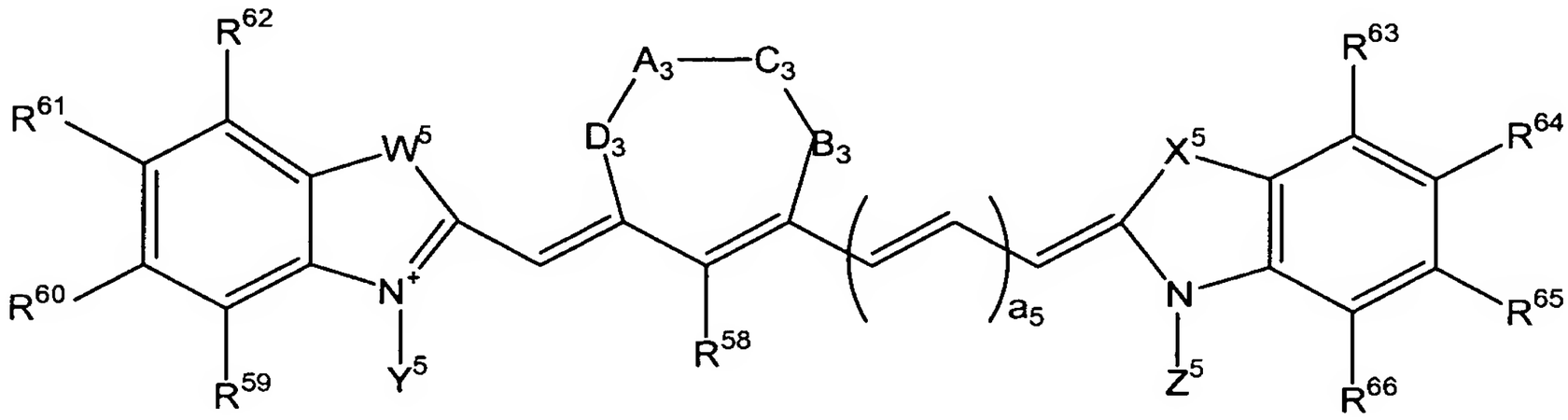
wherein W^4 and X^4 may be the same or different and are selected from the group consisting of $-CR^1R^2$, -O-, $-NR^3$, -S-; Y^4 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a$-CONH-Bm, $-CH_2-(CH_2OCH_2)_b-CH_2$-CONH-Bm, $-(CH_2)_a$-NHCO-Bm, $-CH_2-(CH_2OCH_2)_b-CH_2$-NHCO-Bm, $-(CH_2)_a-N(R^3)-(CH_2)_b$-CONH-Bm, $(CH_2)_a-N(R^3)-(CH_2)_c$-NHCO-Bm, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2$-CONH-Bm, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2$-NHCO-Bm, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a$-CONH-Bm, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a$-NHCO-Bm, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d$-CONH-Bm, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d$-NHCO-Bm, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; Z^4 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10}

aminoalkyl, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Dm$, $-(CH_2)_a-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Dm$, $-(CH_2)_a-N(R^3)-(CH_2)_b-CONH-Dm$, $(CH_2)_a-N(R^3)-(CH_2)_c-NHCO-Dm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Dm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-NHCO-Dm$, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; A_2 is a single or a double bond; B_2, C_2, and D_2 may be the same or different and are selected from the group consisting of -O-, -S-, -Se-, -P-, $-CR^1R^2$, $-CR^1$, alkyl, NR^3, and -C=O; A_2, B_2, C_2, and D_2 may together form a 6- to 12-membered carbocyclic ring or a 6- to 12-membered heterocyclic ring optionally containing one or more oxygen, nitrogen, or sulfur atom; a_4 and b_4 independently vary from 0 to 5; R^1 to R^4, and R^{45} to R^{57} are independently selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, glucose derivatives of R groups, cyano, nitro, halogen, saccharide, peptide, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-OH$ and $-CH_2-(CH_2OCH_2)_b-CO_2H$; Bm and Dm are independently selected from the group consisting of a bioactive peptide, a protein, a cell, an antibody, an antibody fragment, a saccharide, a glycopeptide, a peptidomimetic, a drug, a drug mimic, a hormone, a metal chelating agent, a radioactive or nonradioactive metal complex, a photosensitizer for

phototherapy, and an echogenic agent; a and c are independently from 1 to 20; and b and d are independently from 1 to 100.

42. The method of claim 41 wherein the organic solvent is selected from the group consisting of dimethylsulfoxide, ethyl alcohol, isopropyl alcohol, a polyol, a glycerol, and combinations thereof.

43. A method to maintain fluorescence of a dye in a photodiagnosis or phototherapy procedure comprising administering to an individual an effective amount of a composition comprising a biocompatible organic solvent at a concentration from about 1% to about 50% and a dye of formula 3



wherein W^5 and X^5 may be the same or different and are selected from the group consisting of $-CR^1R^2$, -O-, $-NR^3$, -S-; Y^5 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-N(R^3)-(CH_2)_b-CONH-Bm$, $(CH_2)_a-N(R^3)-(CH_2)_c-NHCO-Bm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-NHCO-Bm$, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; Z^5 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Dm$,

$-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Dm$, $-(CH_2)_a-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Dm$, $-(CH_2)_a-N(R^3)-(CH_2)_b-CONH-Dm$, $(CH_2)_a-N(R^3)-(CH_2)_c-NHCO-Dm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Dm$, $-(CH_2)_a-N(R^3)-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-(CH_2)_a-NHCO-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-CONH-Dm$, $-CH_2-(CH_2OCH_2)_b-CH_2-N(R^3)-CH_2-(CH_2OCH_2)_d-NHCO-Dm$, $-(CH_2)_a-NR^3R^4$, and $-CH_2(CH_2OCH_2)_b-CH_2NR^3R^4$; A_3 is a single or a double bond; B_3, C_3, and D_3 may be the same or different and are selected from the group consisting of -O-, -S-, -Se-, -P-, $-CR^1R^2$, $-CR^1$, alkyl, NR^3, and -C=O; A_3, B_3, C_3, and D_3 may together form a 6- to 12-membered carbocyclic ring or a 6- to 12-membered heterocyclic ring optionally containing one or more oxygen, nitrogen, or sulfur atom; a_5 is independently from 0 to 5; R^1 to R^4, and R^{58} to R^{66} are independently selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_5-C_{20} aryl, C_1-C_{10} alkoxyl, C_1-C_{10} polyalkoxyalkyl, C_1-C_{20} polyhydroxyalkyl, C_5-C_{20} polyhydroxyaryl, C_1-C_{10} aminoalkyl, glucose derivatives of R groups, cyano, nitro, halogen, saccharide, peptide, $-CH_2(CH_2OCH_2)_b-CH_2-OH$, $-(CH_2)_a-CO_2H$, $-(CH_2)_a-CONH-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-CONH-Bm$, $-(CH_2)_a-NHCO-Bm$, $-CH_2-(CH_2OCH_2)_b-CH_2-NHCO-Bm$, $-(CH_2)_a-OH$ and $-CH_2-(CH_2OCH_2)_b-CO_2H$; Bm and Dm are independently selected from the group consisting of a bioactive peptide, a protein, a cell, an antibody, an antibody fragment, a saccharide, a glycopeptide, a peptidomimetic, a drug, a drug mimic, a hormone, a metal chelating agent, a radioactive or nonradioactive metal complex, a photosensitizer for phototherapy, and an echogenic agent; a and c are independently from 1 to 20; and b and d are independently from 1 to 100.

44. The method of claim 43 wherein the organic solvent is selected from the group consisting of dimethylsulfoxide, ethyl alcohol, isopropyl alcohol, a polyol, a glycerol, and combinations thereof.